

# NCCS System Environment

National Aeronautics and  
Space Administration



## COMPUTE

### "Discover" Cluster

110 TF Peak, 10,752 cores, 22.8 TB main memory,  
InfiniBand interconnect

#### Base Unit:

- 128 nodes 3.2 GHz Xeon Dempsey (Dual Core)

#### SCU1 and SCU2:

- 512 nodes 2.6 GHz Xeon Woodcrest (Dual Core)

#### SCU3 and SCU4:

- 512 nodes 2.5 GHz Xeon Harpertown (Quad Core)

#### SCU5:

- 512 nodes 2.8 GHz Xeon Nehalem (Quad Core)

## STORAGE

### Mass Storage Archive

- | SGI Front-End        | StorageTek                    |
|----------------------|-------------------------------|
| - DMF managed        | - 16.5 PB capacity            |
| - SGI Altix BX2      | - T10K, 9940 tape drives      |
| - 64 CPUs            | - 9310, SL8500 tape libraries |
| - 128 GB main memory |                               |

### Shared Storage

- 1.2 PB
- GPFS managed
- nobackup/scratch filesystems

## USER INTERFACE

### Analysis & Visualization

- |                              |                                       |
|------------------------------|---------------------------------------|
| Dali: 128 cores, 2 TB RAM    | Software Tools                        |
| Visor: 16 nodes, NVIDIA GPUs | - ESG/CDAT, IDL, Matlab GrADS, ferret |

### Data Portal

- |                                 |                      |
|---------------------------------|----------------------|
| HP Blade Server                 | Software Tools       |
| - 128 CPUs                      | - IDL, Matlab, GrADS |
| - 128 GB main memory            | - Web services       |
| - 100 TB network storage (GPFS) | - scp, ftp, bbftp    |
| - NFS served to compute hosts   |                      |



For More Information:

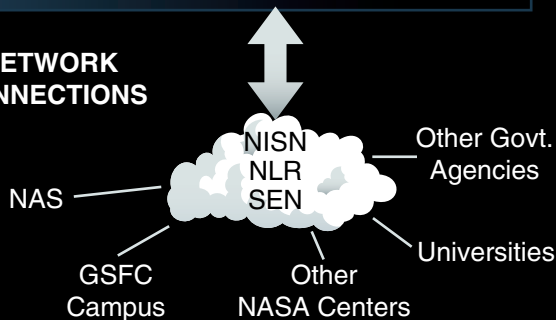
**Dr. W. Phillip Webster**

NCCS Project  
Computational and Information Sciences  
and Technology Office  
Code 606

NASA Goddard Space Flight Center  
Greenbelt, MD 20771

<http://www.nccs.nasa.gov>

## NETWORK CONNECTIONS



# High Performance Computing at Goddard Space Flight Center

NASA Center for  
Computational Sciences

[www.nasa.gov](http://www.nasa.gov)

## NCCS

### Who We Are

The NASA Center for Computational Sciences (NCCS), located at NASA Goddard Space Flight Center, is a High End Computing (HEC) facility that provides a range of supercomputing and data services to scientists throughout NASA's Science Mission Directorate (SMD). The NCCS is part of the NASA HEC Program, together with its sister facility, the NASA Advanced Supercomputing (NAS) facility located at NASA Ames Research Center.

NCCS is funded by the SMD. Scientists request supercomputing resources from NASA HQ as part of the scientific proposal process via programs such as ROSES, MAP, NEWS, AURA, etc. Based on the specific needs of each science project, SMD allocates NCCS and/or NAS hours depending on the types of computing services required.

### Our User Community

NCCS supports modeling and analysis activities for SMD users in Earth, space, and solar research including:

- **Atmospheric modeling** for climate and weather research
- **Ocean modeling** for climate, chemistry, and biology
- **Land surface modeling** for agriculture, land use, and water resource management
- **Space and solar modeling** for fundamental physics and astronomy, space weather, and gravitational wave studies
- **Coupled models and systems of models** in support of collaborative science efforts
- **Observing system studies** to enhance the use and design of space instruments

## NCCS Support Services

### Computing

- Multiple large-scale high performance clusters
- Tools for job scheduling & monitoring
- Portal to National Leadership Class System at NASA/ARC

### Data Archival & Stewardship

- Large-capacity storage
- Tools to manage and protect data
- Data migration support

### Code Development

- Environment for code development & test
- Code repository for collaboration
- Code porting & optimization support
- Earth System Modeling Framework (ESMF) assistance

### Networks

- Internal NCCS high-speed interconnects for HEC components
- Center high-bandwidth access to NCCS for GSFC-based users
- Multi-gigabit network supports on-demand data transfers between NCCS and NAS

### Analysis & Visualization

- Interactive analysis environment
- Software tools for image display
- Easy access to data archive
- Specialized data visualization support

### Data Sharing

- Capability to share data & results
- Supports community based development
- Facilitates data distribution and publishing

### User Services

- Help Desk
- Account support
- User teleconferences
- Training & tutorials

